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09/615,021	07/13/2000	G. Michael Phillips	35512-00033	3965

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EXAMINER
SUBRAMANIAN, NARAYANSWAMY

ART UNIT	PAPER NUMBER
3624	

DATE MAILED: 05/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/615,021	Applicant(s) PHILLIPS ET AL.	
	Examiner Narayanswamy Subramanian	Art Unit 3624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 May 2003* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27,37 and 39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-27,37 and 39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. This office action is in response to applicant's communication filed on May 5, 2003. Claims 28-36, 38 and 40 have been canceled as requested by the applicants. Claims 1- 27, 37 and 39 have been re-examined. The rejections are stated below.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-18, 21-27, 37 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bekaert et al (US Patent 6125355)

With reference to Claims 1, 7, 37 and 39, Bekaert teaches a method, an apparatus and a computer-readable medium respectively, for evaluating an asset, comprising: (a) processing historical data for value of an asset and historical data values for plural exogenous variables to obtain a formula for calculating a measure of a tendency of the value of the asset to change as a result of changes in the data values for the exogenous variables, wherein said formula is a function of the exogenous variables; and (b) obtaining projected data values for the exogenous variables. (See Bekaert Column 1 lines 9 – 20, Column 2 lines 29-30, Column 3 lines 47-67, Column 4 lines 23-30 and 60-62, Column 6 lines 24-26 and Column 8 lines 1-3 and claim 14) The input variables for the pricing module are interpreted to include historical data values and estimated prices include the step of estimating a formula for calculating a measure of a tendency of the value of the asset to change as a result of changes in the data values for the exogenous

variables. Bekaert inherently teaches the step of estimating a measure of the tendency of the value of the asset to change based on a change in at least one of the exogenous variables using the formula obtained in step (a) and the projected data values input in step (b).

Alternatively, official notice is taken that the step of estimating a measure of the tendency of the value of the asset to change based on a change in at least one of the exogenous variables using the formula obtained in step (a) and the projected data values input in step (b) is old and well known in the art. In a given model the derivative of a dependent variable with respect to an independent variable yields the regression coefficient for that independent variable. Estimating the regression coefficients will help the user understand how a dependent variable will change for a unit change in an independent variable without resorting to detailed computations. It will also help the user understand the estimated model better. In multiple regression techniques the changes in a dependent variable are measured by first estimating the regression coefficients for each independent variable and later multiplying the estimated coefficients by the projected or estimated values of the independent variables. Using multiple regression techniques helps the user come up with a reliable and robust model for measuring changes in the dependent variable based on changes in the independent variables (the dependent variable is dependent on). It would have been obvious to one with ordinary skill in the art at the time of invention to include the step of estimating a measure of the tendency of the value of the asset to change based on a change in at least one of the exogenous variables using the formula obtained and the projected data values input to the teaching of Bekaert. The combination of the disclosures taken as a whole suggests that it would help the user come up with a reliable and robust model for measuring changes in the asset value based on changes in the exogenous variables.

With reference to Claims 2 and 6, Bekaert teaches a method of claim 1 wherein said asset comprises a share of stock in a corporation and wherein the value of said asset comprises a market price for said asset. (See Bekaert Column 3 lines 39-44) The stock prices are interpreted to include market price of the asset.

With reference to Claims 3-5, Bekaert teaches a method of claim 1 wherein the asset comprises a mutual fund. (See Bekaert Column 3 lines 43-46) Mutual funds are interpreted to include a portfolio of shares and also an index, as in the case of an index fund.

With reference to Claim 12, Bekaert teaches a method of claim 7 wherein said price formula describes a logarithm of the value of said asset as a function of logarithms of said exogenous variables. (See Bekaert Column 11 lines 3-6)

With reference to Claims 13 and 14, Bekaert teaches a method of claim 1 wherein step (b) comprises obtaining current values for said exogenous variables and allowing a user to alter plural of said current values to produce a "what if' scenario, and wherein data values for said "what if' scenario are used as said projected data values for the exogenous variables and further comprising a step of repeating steps (b) and (c) using different projected data values for the exogenous variables. (See Bekaert Column 4 lines 45-50)

With reference to Claim 21, Bekaert teaches a method of claim 1 further comprising the steps of repeating steps (a) through (c) for plural different assets and selecting a subset of said plural assets based on measure estimated in step (c). (See Bekaert Column 4 lines 17-23) Determination of one or more optimal portfolios is interpreted to include the step of selecting a subset and steps of repeating (a) through (c) for plural different assets are inherent in the method of Bekaert.

With reference to Claims 15 and 16, Bekaert teaches a method of claim 1 as discussed above.

Bekaert fails to explicitly teach the step wherein said tendency of the value of the asset to change based on the change in said at least one of the exogenous variables is a measure of elasticity or sensitivity of the value of the asset to said at least one of the exogenous variables.

Official notice is taken that it is old and well known in the art that the coefficients of a multiple linear regression represent the sensitivity of a dependent variable with respect to changes in independent variables. It is also old and well known in the art that if a dependent variable is a product of independent variables (like in a Cobb Douglass function for instance), the exponents of the independent variables represent the elasticity of the dependent variable with respect to changes in the independent variable. Also regression coefficients of a log-transformed function would represent elasticity measures.

It would have been obvious to one with ordinary skill in the art at the time of the current invention to combine the steps of providing the regression coefficients of a linear regression or a log-transformed regression to the invention of Bekaert. The combination of the disclosures taken as a whole suggests that users would have benefited from the further insights that these statistics provide about the estimated model.

With reference to Claims 8, 9, and 23 - 26, Bekaert teaches methods of claims 7 and 1 respectively as discussed above. The pricing module implies the pricing formula. (See Bekaert Column 3 lines 42-46) The step of measuring tendency to change by inputting different data values for the exogenous variables and observing how an output of said price formula changes as a result of small changes in the data values for the exogenous variables is inherent in the

simulation process of the Simulation module, historical factor analysis and the asset scenarios of the pricing module. (See Bekaert Column 4 line 45 – Column 5 line 15)

Bekaert fails to explicitly teach the step of using non-linear regression or neural network processing for estimating the formula.

Official notice is taken that the step of using non-linear regression or neural network processing for estimating a formula is old and well known in the art. Non-linear regression techniques help the user robustly estimate models when the dependent variables are a non-linear function of exogenous variables and choose a method that best fits their data and as a result their forecasts would be more reliable. The Cobb-Douglass function in economics is a good example of a non-linear function. Using neural networks to estimate a formula saves time, money and makes the estimating process more accurate and efficient.

It would have been obvious to one with ordinary skill in the art at the time of the current invention to combine the step of using non-linear regression or neural network processing for estimating the formula to the invention of Bekaert. The combination of the disclosures taken as a whole suggests that users would have benefited from developing more robust models and as a result their forecasts would be more reliable. The combination also suggests the neural networks would help the user save time, money and make the estimating process more accurate and efficient.

With reference to Claims 10 and 11, Bekaert teaches a method of claim 7 as discussed above.

Bekaert fails to explicitly teach the step wherein said price formula is in a format of a truncated Taylor series expansion or a truncated Maclaurin series expansion.

Official notice is taken that the step of using a truncated Taylor series expansion or a truncated Maclaurin series expansion to estimate a formula are old and well known in the art. Truncating a series expansion significantly reduces the number of computations necessary to estimate the model without significantly sacrificing the accuracy of the estimated model.

It would have been obvious to one with ordinary skill in the art at the time of the current invention to combine the step of using a truncated Taylor series expansion or a truncated Maclaurin series expansion to estimate the formula to the invention of Bekaert. The combination of the disclosures taken as a whole suggests that users would have benefited from the cost and time savings as a result of the truncation.

With reference to Claims 17 and 18, Bekaert teaches a method of claim 1 as discussed above.

Bekaert fails to explicitly teach the step of determining the reliability of the estimated model and the step of performing Student's t-test.

Official notice is taken that the step of determining the reliability of the estimated model and the step of performing Student's t-test are old and well known in the art. C-squared statistic and F-Statistic are normally used to test the reliability of the model and Student's t-tests are used to test the reliability of individual regression coefficients.

It would have been obvious to one with ordinary skill in the art at the time of the current invention to combine the steps of determining the reliability of the estimated model and performing Student's t-test to the invention of Bekaert. The combination of the disclosures taken as a whole suggests that users would have benefited from getting a measure of reliability of the estimated model and allowed them to choose alternative models that provide better reliability.

With reference to Claim 22, Bekaert teaches a method of claim 21 as discussed above. The portfolio optimization module of Bekaert uses inputs from parameter, pricing and simulation modules. These three modules are interpreted to provide all the necessary inputs that the optimization module needs to determine one or more optimal portfolios.

Bekaert fails to explicitly teach the step of determining the reliability of the estimated models and selecting a subset of assets based on the reliability of the models.

Official notice is taken that the step of determining the reliability of the estimated model and selecting a subset of assets based on the reliability of the models are well known in the art. C-squared statistic and F-Statistic are normally used to test the reliability of the model and more reliable a model the better the chance of its selection.

It would have been obvious to one with ordinary skill in the art at the time of the current invention to combine the step of determining the reliability of the estimated models and selecting a subset of assets based on the reliability of the models to the invention of Bekaert. The combination of the disclosures taken as a whole suggests that users would have benefited from getting a measure of reliability of the estimated model and allowed them to choose alternative subsets of assets that have greater reliability.

With reference to Claim 27, Bekaert teaches a method of claim 1 as discussed above.

Bekaert fails to explicitly teach the step of using a genetic algorithm to obtain a formula.

Official notice is taken that the step of using a genetic algorithm to obtain a formula is old and well known in the art. A genetic algorithm could provide a more robust and efficient formula for certain situations compared to conventional regression techniques.

It would have been obvious to one with ordinary skill in the art at the time of the current invention to combine the step of using a genetic algorithm to obtain a formula to the invention of Bekaert. The combination of the disclosures taken as a whole suggests that users would have benefited from the flexibility provided by having more method to estimate the formula. Also a genetic algorithm could provide a more robust and efficient formula for certain situations than other.

6. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bekaert et al (US Patent 6125355) in view of Ray et al (US Patent 6018722)

With reference to Claims 19 and 20, Bekaert teaches a method of claim 1 as discussed above.

Bekaert fails to explicitly teach the steps of initiating at least one of a purchase of said asset and a sale of said asset, and initiating at least one of a purchase of another asset and a sale of said other asset based on the estimate made in step (c).

Ray et al teaches the steps of initiating a purchase or sale of any security based on the recommendation of an expert system. (See Ray claims 1, 5 and 7).

It would have been obvious to one with ordinary skill in the art at the time of the current invention to combine the steps taught by Ray to the invention of Bekaert. The combination of the disclosures taken as a whole suggests that users would have benefited from a timely follow up on the recommendation based on the estimate made in step (c). Timely follow up would also make the process more efficient.

Response to Arguments

7. Applicant's arguments with respect to claims 1-27, 37 and 39 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Narayanswamy Subramanian whose telephone number is (703) 305-4878. The examiner can normally be reached Monday-Thursday from 8:30 AM to 7:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vincent Millin can be reached at (703) 308-1065.

The fax number for Formal or Official faxes and Draft or Informal faxes to Technology Center 3600 or this Art Unit is (703) 305-7687.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-1113.

N. Subramanian
May 15, 2003

Richard Weisberger
Primary Examiner